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TEST REPORT ON CEMENT

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

SUB - NAME OF WORK: Construction of Bangalore One Centre Building at Balaji Layout and Kodigehalli Village in ward No 8 Kodigehalli, Kodigehalli Sub Division.

Client: Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/20

Site Location:Sahakarnagara playground Besides to balamurali vinayaka temple

Date of Testing: 08-06-2019

SAMPLE ID: Cement (ACC 53 Grades)

PHYSICAL REQUIREMENTS :

Sl no	Description	Test Method as per IS	Test Result	Remarks
1	a) Initial setting time	IS: -4031 (part-5)	127 Minutes	OK
	b) Final setting time	IS: -4031 (part-5)	458Minutes	OK
2	Soundness	IS: 4031 (part-3) La-Chatelier method	3.0 mm	OK
3	Standard Consistency	IS: -4031 (part-4)	25.00%	OK
4	Compressive Strength			OK
	a) 3 Days	Mpa	26	OK
	b) 7 Days	Mpa	37	OK

#42/1, 6th Main Road, Jnanajyothi Nagara, Malathalli, Bangalore – 560 056.Tel: 080-23241948, Fax: 080 - 23240685, Cell : 9964339888 E-mail : mbnk2278@yahoo.com

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TEST REPORT ON FINE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

SUB - NAME OF WORK : Construction of Bangalore One Centre Building at Balaji Layout and Kodigehalli Village in ward No 8 Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Site Location:Sahakarnagara playground Besides to balamurali vinayaka temple

Date of Testing: 04-06-2019

SAMPLE ID : Sand

Total Wt of Aggregate in gms : 1350

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
10	0	0	0	100	100
4.75	30	30	2.22	97.78	90-100
2.36	62	92	6.81	93.82	75-100
1.18	90	182	13.48	86.52	55-90
600 Micron	480	662	49.03	50.97	35-59
300 Micron	358	1020	75.55	24.45	8-30
150 Micron	325	1345	99.62	0.38	0-10

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TEST REPORT ON COARSE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - NAME OF WORK : Construction of Bangalore One Centre Building at Balaji Layout and Kodigehalli Village in ward No 8 Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Site Location:Sahakarnagara playground Besides to balamurali vinayaka temple

Date of Testing: 04-06-2019

SAMPLE ID : 20 mm Aggregate

Total Wt of Aggregate in gms : 2300

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
40	0	0	0	100	100
20	195	195	8.125	91.87	95-100
10	1150	1345	56.04	43.96	25-55
4.75	955	2300	95.87	4.125	0-10

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TEST REPORT ON REINFORCEMENT STEEL

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - NAME OF WORK : Construction of Bangalore One Centre Building at Balaji Layout and Kodigehalli Village in ward No 8 Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Site Location:Sahakarnagara playground Besides to balamurali vinayaka temple

Date of Testing : 04-06-2019

SAMPLE ID : Fe 500 TMT Steel Bars

Sl. no	Dia in MM	Weight in Kg/m	C/s area in mm2	Ultimate load in KN	Ultimate Tensile stress in N/mm2	Remarks
1	10	0.616	78.53	41.84	533	OK
2	12	0.888	113.097	61.94	548	OK
3	16	1.578	201.061	109.5	545	OK

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Survey and Engineering Project Consultants

BITUMEN EXTRACTION TEST [FIELD TEST] FOR BM

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client: Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92.

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17Dated: 16/01/2018

Date of Testing: 20-10-2019

Tests on Bituminous Macadam				
Test No 1				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100in %**
1	500	482.5	17.5	3.5
2	500	482	18	3.6
Test No 2				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100] in %**
1	500	482	18	3.6
2	500	482.5	17.5	3.5

Note:

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GRADIATION FOR WMM

MORTH TABLE – 400 - 11

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing:23-09-2019

IS Sieve Size in mm	Weight Retained (gms)	Cumulative Weight Retained (gms)	Cumulative % of Retained	Cumulative % of Passing	Specific Limits
53	0	0	0	100	100
45	275	275	3.1	96.9	95-100
22.4	2665	2940	33.3	66.7	60-80
11.2	1345	4285	48.5	51.5	40-60
4.75	1290	5575	63.1	36.9	25-40
2.36	1025	6600	74.7	25.3	15-30
0.600	965	7565	85.6	14.4	8-22
0.075	940	8505	96.2	3.8	0-8

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GRADIATION FOR WMM

MORTH TABLE – 400 - 11

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

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Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 23-09-2019

IS Sieve Size in mm	Weight Retained (gms)	Cumulative Weight Retained (gms)	Cumulative % of Retained	Cumulative % of Passing	Specific Limits
53	0	0	0	100	100
45	117	117	1.4	98.6	95-100
22.4	2514	2631	30.9	69.1	60-80
11.2	1478	4109	48.3	51.7	40-60
4.75	1352	5461	64.2	35.8	25-40
2.36	998	6459	75.9	24.1	15-30
0.600	945	7404	87.0	13.0	8-22
0.075	902	8306	97.6	2.4	0-8

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Aggregate Impact Value (W.M.M.)

IS : 2386 Part IV

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 24-09-2019

Sl. No	Details	Trial No.		Average
		1	2	
1	Total Weight of aggregate sample filling the cylindrical measure = W_1 g	386	383	
2	Weight of aggregate passing throw 2.36 mm IS sieve after the test = W_2 g	89	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	366	361	
4	Aggregate Impact value = percent fine	23.06	22.19	22.63
	$100*(W_2/W_1)\%$			

Comments:

- **Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%.**

Note:

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Aggregate Impact Value (W.M.M.)

IS : 2386 Part IV

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

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Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 24-09-2019

Sl. No	Details	Trial No.		Average
		1	2	
1	Total Weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of aggregate passing throw 2.36 mm IS sieve after the test = W_2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	365	363	
4	Aggregate Impact value = percent fine	21.52	21.93	22.73
	$100*(W_2/W_1)\%$			

Comments:

- **Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%.**

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Determination of Flakiness Index & Elongation Index of Coarse Aggregate.

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 24-09-2019

Result: Flakiness Index = 12.32%.

Elongation Index = 13.63%.

Result:Combined Flakiness & Elongation Index = 25.95%.

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%.

Note:

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Determination of Flakiness Index & Elongation Index of Coarse Aggregate.

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : **24-09-2019**

Result: Flakiness Index = 12.3%.

Elongation Index = 13.55%.

Result:Combined Flakiness & Elongation Index = 25.85%.

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%.

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BITUMEN EXTRACTION TEST [FIELD TEST]

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : 22-10-2019

Tests on Bituminous Concrete				
Test No 1				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100, in %**
1	500	472.5	27.5	5.5
2	500	473	27	5.4
Test No 2				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100] in %**
1	500	472.5	27.5	5.5
2	500	472.5	27.5	5.5

Note :

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BITUMEN EXTRACTION TEST [FIELD TEST]

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : 22-10-2019

Tests on Bituminous Concrete				
Test No 1			**Test Time :**	**11.5 AM**
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100 in %**
1	500	473	27	5.4
2	500	473	27	5.4
Test No 2				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100] in %**
1	500	473	27	5.4
2	500	472.5	27.5	5.5

Note :

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DESIGN OF BITUMINOUS CONCRETE

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

BITUMEN TEST

Sl no	Test	Results Obtained	As per IS Specification	IS Specification
01	Penetration @ 25°C	65	60-70	IS 73:2013
02	Ductility @ 25° C, min	100cm	40	IS 1208
03	Specific Gravity	1.02	0.97-1.02	IS 1202
04	Flash point C, min	230	220	IS 73:2013
05	Softening Point, (R&B) C, min	48	47	IS 73:2013

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

JOB MIX FORMULA

Table 1, Job mix formula for BC Grade- II (Proportioning of Aggregates)

Sieve Size	Materials A % Passing	Materials B % Passing	Materials C % Passing	Materials D % Passing	Obtained gradation % passing	Desired gradation BC grade II ,% passimg MORTH 5th Rev
19	100	100.00	100.00	100	100	100
13.2	89.20	100	100	100	90.70	90-100
9.5	16.7	79.00	100	100	76.96	70-88
4.75	2.24	8.52	78.25	100	63.01	53-71
2.36	0.79	1.60	52.55	92.60	55.51	42-58
1.18		1.10	21.20	83.60	48.35	34-48
0.600		1.00	10.60	63.60	36.49	26-38
0.300		0.94	6.85	43.10	24.77	18-28
0.150		0.86	4.20	22.50	13.	12-20
0.075		0.66	2.25	10.90	6.40	4-10

Material A 20mm = 12%

Material B 1 2.5 mm = 24%

Material C 6.0mm = 6%

Material D 4.75 mm down = 56%

Filler Cement = 2%

Note:-Test and mix design results are for the aggregates and bitumen

Assistant Executive Engineer
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TEST REPORT ON STABILITY OF MIX

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

Table 2, Marshal Stability, Flow, Density and Voids Analysis for BC Grade- II

Marshal Properties	Obtained	Standards
Marshal Stability, kg	1855	Min 900
Flow Value, mm	3.3	2-4
Gb, gm	2.38	-
Air Voids (Vv) %	3.79	3-5
Voids filled with Mineral Aggregates(VMA)%	16.70	13.0 Minimum
Voids Filled with Bitumen (VFB)	74.7	65-75
Bitumen Concrete %	5.8	5-7

Gb: Bulk Density
Vv: Air Voids
Vb: Volume of Bitumen
VFB: Voids Filled with bitumen %
VMA: Voids in the Mineral Aggregates %

Note: Test and mix design results are for the aggregates and bitumen

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

BITUMEN DETERMINATION OF BITUMINOUS MACADAM MIXAs per IRC: SP: 11-1984

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 14-10-2019

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test , g	500	500
2. Weight of Mixture after Test, g	482.5	483
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17.5	18
7. Bitumen content in %	3.5	3.6
8. Average	3.55	

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Assistant Executive Engineer
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GRADATION DETERMINATIONOF BITUMINOUS MACADAM MIXAs per IS : SP : 2386 and IRC : SP : 11 - 1984

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 14-10-2019

GRADATION AFTER EXTRACTION

TRIAL 1

Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Specification Limits as per MORTH specification table 500-10(Grading-2)
37.5	0	0	0	100	100
26.5	39.58	8.29	8.29	91.71	90 - 100
19	82.36	17.25	25.54	74.46	71 - 95
13.2	70.67	14.80	40.34	59.96	56 - 80
4.75	95.58	20.02	60.35	39.65	38 - 54
2.36	45.85	9.60	69.96	30.04	28 - 42
0.3	75.97	15.91	85.87	14.13	7 – 21
0.075	122.53	25.66	95.62	4.38	2 - 8

M.D

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

TRIAL 2

Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Specification Limits as per MORTH specification table 500-10(Grading-2)
37.5	0	0	0	100	100
26.5	36.42	7.60	7.60	92.40	90 - 100
19	89.46	18.75	26.35	73.65	71 - 95
13.2	78.65	16.49	42.84	57.16	56 - 80
4.75	82.96	17.39	60.23	39.77	38 - 54
2.36	43.63	9.15	69.38	30.62	28 - 42
0.3	80.87	16.95	86.33	13.67	7 – 21
0.075	117.56	24.65	94.03	5.97	2 - 8

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TEST REPORT ON STABILITY OF MIX

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 18-10-2019

Table 2, Marshal Stability, Flow, Density and Voids Analysis for BC Grade- II

Marshal Properties	Obtained	Standards
Marshal Stability, kg	1855	Min 900
Flow Value, mm	3.3	2-4
Gb, gm	2.38	-
Air Voids (Vv) %	3.79	3-5
Voids filled with Mineral Aggregates(VMA)%	16.70	13.0 Minimum
Voids Filled with Bitumen (VFB)	74.7	65-75
Bitumen Concrete %	5.8	5-7

Gb: Bulk Density

Vv: Air Voids

Vb: Volume of Bitumen
VFB: Voids Filled with bitumen %
VMA: Voids in the Mineral Aggregates %

Note: Test and mix design results are for the aggregates and bitumen

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Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

B V H Consulting Engineers
Survey and Engineering Project Consultants

BITUMEN EXTRACTION TEST [FIELD TEST] FOR BM

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client: Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92.

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17Dated: 16/01/2018

Date of Testing: 21-10-2019

Tests on Bituminous Macadam				
Test No 1				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100 in %**
1	500	482	18	3.6
2	500	482	18	3.6
Test No 2				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100] in %**
1	500	482.5	17.5	3.5
2	500	482.5	17.5	3.5

Note:

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BITUMEN EXTRACTION TEST [FIELD TEST] FOR BM

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client: Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92.

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17Dated: 16/01/2018

Date of Testing: 22-10-2019

Tests on Bituminous Macadam				
Test No 1				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100 in %**
1	500	482	18	3.6
2	500	482	18	3.6
Test No 2				
Sample No	**Initial Weight of the Mix [w1], in g**	**Weight of mix after extraction of Bitumen [w2], in g**	**Difference in weight, w=[w1-w2], in g**	**Percentage of Bitumen Extracted = [(w /w1)*100] in %**
1	500	482	18	3.6
2	500	482.5	17.5	3.5

Note:

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M.N.D

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

BITUMEN DETERMINATION OF BITUMINOUS MACADAM MIXAs per IRC: SP: 11-1984

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test , g	500	500
2. Weight of Mixture after Test, g	482.5	483
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17.5	18
7. Bitumen content in %	3.5	3.6
8. Average	3.55	

Note:

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GRADATION DETERMINATIONOF BITUMINOUS MACADAM MIXAs per IS : SP : 2386 and IRC : SP : 11 - 1984

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

GRADATION AFTER EXTRACTION

TRIAL 1

Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Specification Limits as per MORTH specification table 500-10(Grading-2)
37.5	0	0	0	100	100
26.5	39.58	8.29	8.29	91.71	90 - 100
19	82.36	17.25	25.54	74.46	71 - 95
13.2	70.67	14.80	40.34	59.96	56 - 80
4.75	95.58	20.02	60.35	39.65	38 - 54
2.36	45.85	9.60	69.96	30.04	28 - 42
0.3	75.97	15.91	85.87	14.13	7 – 21
0.075	122.53	25.66	95.62	4.38	2 - 8

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

TRIAL 2

Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Specification Limits as per MORTH specification table 500-10(Grading-2)
37.5	0	0	0	100	100
26.5	36.42	7.60	7.60	92.40	90 - 100
19	89.46	18.75	26.35	73.65	71 - 95
13.2	78.65	16.49	42.84	57.16	56 - 80
4.75	82.96	17.39	60.23	39.77	38 - 54
2.36	43.63	9.15	69.38	30.62	28 - 42
0.3	80.87	16.95	86.33	13.67	7 – 21
0.075	117.56	24.65	94.03	5.97	2 - 8

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Kadugehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

AGGREGATE GRADATION TEST BITUMINOUS MACADAM MIXAs

perIS:SP:2386 PART 1

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

Total Weight of Sample

Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Grade –II As per MORTH	Remarks
37.5	0	0.0	0	100	100	Gradation Satisfies grade II MORTH specification
26.5	895	6.2	6.24	93.76	90 - 100	
19	2126	14.8	21.06	78.94	71 - 95	
13.2	2185	15.2	36.29	63.71	56 - 80	
4.75	2894	20.2	56.47	43.53	38 - 54	
2.36	1853	12.9	69.38	30.62	28 - 42	
0.3	2451	17.1	86.47	13.53	7 – 21	
0.075	1257	8.8	95.23	4.77	2 - 8	

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Sieve Size in mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Grade –II As per MORTH	Remarks
37.5	0	0.0	0	100	100	Gradation
26.5	798	5.5	5.53	94.47	90 - 100	Satisfies grade II MORTH specification
19	2235	15.5	21.03	78.97	71 - 95	
13.2	2145	14.9	35.90	64.10	56 - 80	
4.75	2156	14.9	50.84	49.16	38 - 54	
2.36	1663	11.5	62.37	37.63	28 - 42	
0.3	2785	19.3	81.68	18.32	7 – 21	
0.075	1675	11.6	93.29	6.71	2 - 8	

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TEST REPORT ON STABILITY OF MIX

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 15-10-2019

The results of the tests conducted on the bituminous macadam mix sample are as follows:

SL. NO	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, KN	9.25	9.5	9 KN (min)
2	Marshal flow, mm	2.6	3.25	2 – 4
3	Percentage air voids in Minerals Aggregates	3.55	4.3	3 – 6
4	Void in Compacted Mix	11.9	12.45	11 – 13
5	Percent Void filled with Bitumen	66.35	68.1	65 - 75
6	Density, g/cc	2.27	2.26	--

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TEST FOR PRIME COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing :20-10-2019

Determination	Unit	Trial no.	
Size of tray in (sqm)		0.45x0.45	0.45x0.45
Area of tray (a)	Sqm	0.2025	0.2025
Initial Wt of empty tray(b)	Kg	1.625	1.627
Final Wt of tray with prime coat (c)	Kg	1.763	1.756
Weight of Prime coat (d=c-b)	Kg	0.1380	0.1290
Rate of Spray of prime coat	Kg/Sqm	0.681	0.637
Average	Kg/Sqm	0.659	
Specified Limit	Kg/Sqm	0.60 Kg/sqm	

Note :

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B V H Consulting Engineers

Survey and Engineering Project Consultants

TEST FOR PRIME COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 21-10-2019

Determination	Unit	Trial no.	
Size of tray in (sqm)		0.45x0.45	0.45x0.45
Area of tray (a)	Sqm	0.2025	0.2025
Initial Wt of empty tray(b)	Kg	1.625	1.627
Final Wt of tray with prime coat (c)	Kg	1.763	1.756
Weight of Prime coat (d=c-b)	Kg	0.1380	0.1290
Rate of Spray of prime coat	Kg/Sqm	0.681	0.637
Average	Kg/Sqm	0.659	
Specified Limit	Kg/Sqm	0.60 Kg/sqm	

Note :

1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be within 30 days from the date of testing.

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TEST FOR TACK COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing :23-10-2019

Tray no.	1	2
Weight of the tray(b)gms	1688	1688
Weight of the tray with prime(a)gms	1714	1713
Weight of prime(a-b)gms	26	25
Tray area (sqm)	300*300=0.09sqm	300*300=0.09sqm
Rate of spray (kg/sqm)	0.026/0.09=0.29 kg/sqm	0.025/0.09=0.27 kg/sqm
Avg. Rate of spray (kg/sqm)	0.28	

Specified rate as per Specification: 0.25 Kg/sqm

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TEST FOR TACK COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : 23-10-2019

Tray no.	1	2
Weight of the tray(b)gms	1688	1688
Weight of the tray with prime(a)gms	1714	1713
Weight of prime(a-b)gms	26	25
Tray area (sqm)	300*300=0.09sqm	300*300=0.09sqm
Rate of spray (kg/sqm)	0.026/0.09=0.29 kg/sqm	0.025/0.09=0.27 kg/sqm
Avg. Rate of spray (kg/sqm)	0.28	

Specified rate as per Specification: 0.25 Kg/sqm

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TEST FOR TACK COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : **24-10-2019**

Tray no.	1	2
Weight of the tray(b)gms	1688	1688
Weight of the tray with prime(a)gms	1714	1714
Weight of prime(a-b)gms	26	26
Tray area (sqm)	300*300=0.09sqm	300*300=0.09sqm
Rate of spray (kg/sqm)	0.026/0.09=0.29 kg/sqm	0.026/0.09=0.29 kg/sqm
Avg. Rate of spray (kg/sqm)	0.29	

Specified rate as per Specification: 0.25 Kg/sqm

Note:

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Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

TEST FOR TACK COAT

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division

Client : **Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : **24-10-2019**

Tray no.	1	2
Weight of the tray(b)gms	1688	1688
Weight of the tray with prime(a)gms	1714	1713
Weight of prime(a-b)gms	26	25
Tray area (sqm)	300*300=0.09sqm	300*300=0.09sqm
Rate of spray (kg/sqm)	0.026/0.09=0.29 kg/sqm	0.025/0.09=0.27 kg/sqm
Avg. Rate of spray (kg/sqm)	0.28	

Specified rate as per Specification: 0.25 Kg/sqm

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Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

GRADIATION FOR WMM

MORTH TABLE – 400 - 11

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32..

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 09-10-2019

IS Sieve Size in mm	Weight Retained (gms)	Cumulative Weight Retained (gms)	Cumulative % of Retained	Cumulative % of Passing	Specific Limits
53	0	0	0	100	100
45	275	275	3.1	96.9	95-100
22.4	2665	2940	33.3	66.7	60-80
11.2	1345	4285	48.5	51.5	40-60
4.75	1290	5575	63.1	36.9	25-40
2.36	1025	6600	74.7	25.3	15-30
0.600	965	7565	85.6	14.4	8-22
0.075	940	8505	96.2	3.8	0-8

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Assistant Executive Engineer
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Bruhat Bangalore Mahanagara Palike

B V H Consulting Engineers
Survey and Engineering Project Consultants

GRADIATION FOR WMM

MORTH TABLE – 400 - 11

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Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 09-10-2019

IS Sieve Size in mm	Weight Retained (gms)	Cumulative Weight Retained (gms)	Cumulative % of Retained	Cumulative % of Passing	Specific Limits
53	0	0	0	100	100
45	117	117	1.4	98.6	95-100
22.4	2514	2631	30.9	69.1	60-80
11.2	1478	4109	48.3	51.7	40-60
4.75	1352	5461	64.2	35.8	25-40
2.36	998	6459	75.9	24.1	15-30
0.600	945	7404	87.0	13.0	8-22
0.075	902	8306	97.6	2.4	0-8

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B V H Consulting Engineers
Survey and Engineering Project Consultants

GRADIATION FOR WMM

MORTH TABLE – 400 - 11

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

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IS Sieve Size in mm	Weight Retained (gms)	Cumulative Weight Retained (gms)	Cumulative % of Retained	Cumulative % of Passing	Specific Limits
53	0	0	0	100	100
45	117	117	1.4	98.6	95-100
22.4	2514	2631	30.9	69.1	60-80
11.2	1478	4109	48.3	51.7	40-60
4.75	1352	5461	64.2	35.8	25-40
2.36	998	6459	75.9	24.1	15-30
0.600	945	7404	87.0	13.0	8-22
0.075	902	8306	97.6	2.4	0-8

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Aggregate Impact Value (W.M.M.)

IS : 2386 Part IV

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 10-10-2019

Sl. No	Details	Trial No.		Average
		1	2	
1	Total Weight of aggregate sample filling the cylindrical measure = W_1 g	386	383	
2	Weight of aggregate passing throw 2.36 mm IS sieve after the test = W_2 g	89	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	366	361	
4	Aggregate Impact value = percent fine	23.06	22.19	
	100*(W_2/W_1)%			22.63

Comments:

- **Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%.**

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Aggregate Impact Value (W.M.M.)

IS : 2386 Part IV

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

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Name of the Agency : **Benaka Developers & Projects Pvt. Ltd.**

Reference : Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 11-10-2019

Sl. No	Details	Trial No.		Average
		1	2	
1	Total Weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of aggregate passing throw 2.36 mm IS sieve after the test = W_2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	365	363	
4	Aggregate Impact value = percent fine	21.52	21.93	22.73
	$100*(W_2/W_1)\%$			

Comments:

- **Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%.**

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Ashok. N.D

Assistant Executive Engineer

B V H Consulting Engineers
Survey and Engineering Project Consultants

Determination of Flakiness Index & Elongation Index of Coarse Aggregate.

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : **Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92**

Name of the Agency: **Benaka Developers & Projects Pvt. Ltd.**

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 10-10-2019

Result: Flakiness Index = 12.32%.

Elongation Index = 13.63%.

Result:Combined Flakiness & Elongation Index = 25.95%.

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%.

Note:

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Determination of Flakiness Index & Elongation Index of Coarse Aggregate.

NAME OF WORK : Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7 & 8 Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : : Improvements to Roads and Drains in Kannuramma Temple Main Road and Surrounding Area, in Ward No 08 - Kodigehalli, Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, No.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency: Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 10-10-2019

Result: Flakiness Index = 12.3%.

Elongation Index = 13.55%.

Result:Combined Flakiness & Elongation Index = 25.85%.

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%.

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Survey and Engineering Project Consultants

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : near Angala Parameshwari temple **Plinth Beam**

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	11-09-2019	09-10-2019	486	21.58	
2	11-09-2019	09-10-2019	482	21.41	21.46
3	11-09-2019	09-10-2019	482	21.41	

Comments: Minimum Compressive strength as per clause 1051.2.2 design mix 20 N/mm2

Note:

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3. Any Query regarding the report must be within 30 days from the date of testing.

Note: Test results arrived is Satisfactory.

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Survey and Engineering Project Consultants

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : near Angala Parameshwari temple

Column upto Ground Level

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	03-09-2019	01-09-2019	486	21.58	
2	03-09-2019	01-09-2019	482	21.41	21.45
3	03-09-2019	01-09-2019	481	21.37	

Note:

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3. Any Query regarding the report must be within 30 days from the date of testing.

Note: Test results arrived is Satisfactory.

Comments: Minimum Compressive strength as per clause 1051.2.2 design mix 20 N/mm2

Assistant Executive Engineer
Kodigehalli Sub Division
Bangalore Mahanagara Palike

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#42/1, 6th Main Road, Jnanajyothi Nagara, Malathalli, Bangalore – 560 056.Tel: 080-23241948, Fax: 080 - 23240685, Cell : 9964339888 E-mail : mbnk2278@yahoo.com

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : near Angala Parameshwari temple **Column Footing**

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	26-08-2019	23-09-2019	483	21.44	
2	26-08-2019	23-09-2019	486	21.58	21.59
3	26-08-2019	23-09-2019	490	21.77	

Comments: Minimum Compressive strength as per clause 1051.2.2 design mix 20 N/mm2

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Sub - Name of Work : Constructon of Bangalore One Center Biuiding at Balaji Layout and Kodigehalli Village in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location: Kodigehalli Division office Fist Floor **Concrete for Column**

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	19-09-2019	17-10-2019	490	21.77	
2	19-09-2019	17-10-2019	486	21.58	21.70
3	19-09-2019	17-10-2019	490	21.77	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

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NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of Bangalore One Center Biuiding at Balaji Layout and Kodigehalli Village in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location: Kodigehalli Division office Fist Floor **Concrete for Roof Slab**

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	03-10-2019	30-10-2019	486	21.58	
2	03-10-2019	30-10-2019	482	21.41	21.45
3	03-10-2019	30-10-2019	481	21.37	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

Note:

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2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be within 30 days from the date of testing.

Note: Test results arrived is Satisfactory.

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

CONSULTING ENGINEERS Bangalore

#42/1, 6th Main Road, Jnanajyothi Nagara, Malathalli, Bangalore – 560 056.Tel: 080-23241948, Fax: 080 - 23240685, Cell : 9964339888 E-mail : mbnk2278@yahoo.com

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of Bangalore One Center Biuiding at Balaji Layout and Kodigehalli Village in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location: Kodigehalli Division office Fist Floor **Concrete for Roof Slab**

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	03-10-2019	30-10-2019	486	21.58	
2	03-10-2019	30-10-2019	482	21.41	21.45
3	03-10-2019	30-10-2019	481	21.37	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

Note:

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3. Any Query regarding the report must be within 30 days from the date of testing.

Note: Test results arrived is Satisfactory.

Assistant Executive Engineer
Kodigehalli Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

CONSULTING ENGINEERS Bangalore

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Location: Sahakar nagara MCEHS Layout 6th cross (G-Block) Beside HDFC Bank LHS

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

CC ROAD

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	25-09-2019	22-10-2019	483	21.44	
2	25-09-2019	22-10-2019	486	21.58	21.59
3	25-09-2019	22-10-2019	490	21.77	

Comments: Minimum Compressive strength as per clause 1051.2.2 design mix 20 N/mm2

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Survey and Engineering Project Consultants

TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Construction of RO Water Purifier Plant at BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : Sahakarnagara Playground Besides to Sri Balamurali Vinayaka Temple

Concrete for Plinth Beam

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	11-09-2019	09-10-2019	486	21.58	
2	11-09-2019	09-10-2019	482	21.41	21.46
3	11-09-2019	09-10-2019	482	21.41	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

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Note: Test results arrived is Satisfactory.

BVH CONSULTING ENGINEERS Bangalore

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Survey and Engineering Project Consultants

TEST REPORT ON M20 GRADE CONCRETE

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Sub - Name of Work : Construction of RO Water Purifier Plant at BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : Sahakarnagara Playground Besides to Sri Balamurali Vinayaka Temple

Column upto Ground Level

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	03-09-2019	01-10-2019	486	21.58	
2	03-09-2019	01-10-2019	482	21.41	21.45
3	03-09-2019	01-10-2019	481	21.37	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

Note :

1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
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3. Any Query regarding the report must be within 30 days from the date of testing.

Note: Test results arrived is Satisfactory.

Assistant Executive Engineer
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Byrathi Bangalore Municipal Corporation
Bangalore

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TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Construction of RO Water Purifier Plant at BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location : Sahakarnagara Playground Besides to Sri Balamurali Vinayaka Temple

Column Footing

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	26-08-2019	23-09-2019	483	21.44	
2	26-08-2019	23-09-2019	486	21.58	21.60
3	26-08-2019	23-09-2019	490	21.77	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

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Note: Test results arrived is Satisfactory.

B V H CONSULTING ENGINEERS Bangalore

Assistant Executive Engineer
Kodigehalli sub Division
Bangalore Mahanagara Palike
Bangalore - 560 092

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TEST REPORT ON M20 GRADE CONCRETE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of Bangalore One Center Biuiding at Balaji Layout and Kodigehalli Village in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Size of cubes : 150 x150 x 150 mm

Cross Sectional area : 22500 mm2

Grade of concrete : M20

Compressive Strength as on : 28 Days

Location: Kodigehalli Division office Fist Floor

Concrete for Column

Sl no	Date of casting	Date of testing	Failure load	Compressive Strength (N/mm2)	Average Compressive Strength (N/mm2)
1	19-09-2019	17-10-2019	490	21.77	
2	19-09-2019	17-10-2019	486	21.58	21.70
3	19-09-2019	17-10-2019	490	21.77	

Comments: Minimum Compressive Strength Required **20 N/mm Square**

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TEST REPORT ON CEMENT

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : Cement (ACC 53 Grade)

LOCATION : Sahakarnagara Playground Besides to Sri Balamurali Vinayaka Temple

PHYSICAL REQUIREMENTS :

Sl no	Description	Test Method as per IS	Test Result	Remarks
1	a) Initial setting time	IS: -4031 (part-5)	127 Minutes	OK
	b) Final setting time	IS: -4031 (part-5)	458Minutes	OK
2	Soundness	IS: 4031 (part-3) La-Chatelier method	3.0 mm	OK
3	Standard Consistency	IS: -4031 (part-4)	25.00%	OK
4	Compressive Strength			OK
	a) 3 Days	Mpa	26	OK
	b) 7 Days	Mpa	37	OK

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B V H Consulting Engineers
Survey and Engineering Project Consultants

TEST REPORT ON COARSE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : 20 mm Aggregate

Total Wt of Aggregate in gms : 2300

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
40	0	0	0	100	100
20	195	195	8.125	91.87	95-100
10	1150	1345	56.04	43.96	25-55
4.75	955	2300	95.87	4.125	0-10

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3. Any Query regarding the report must be within 30 days from the date of testing.

BVH CONSULTING ENGINEERS Bangalore

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TEST REPORT ON FINE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : Sand

Total Wt of Aggregate in gms : 1350

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
10	0	0	0	100	100
4.75	30	30	2.22	97.78	90-100
2.36	62	92	6.81	93.82	75-100
1.18	90	182	13.48	86.52	55-90
600 Micron	480	662	49.03	50.97	35-59
300 Micron	358	1020	75.55	24.45	8-30
150 Micron	325	1345	99.62	0.38	0-10

Note:

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TEST REPORT ON CEMENT

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : Cement (ACC 53 Grade)

LOCATION : Sahakarnagara Playground Besides to Sri Balamurali Vinayaka Temple

PHYSICAL REQUIREMENTS :

Sl no	Description	Test Method as per IS	Test Result	Remarks
1	a) Initial setting time	IS: -4031 (part-5)	127 Minutes	OK
	b) Final setting time	IS: -4031 (part-5)	458Minutes	OK
2	Soundness	IS: 4031 (part-3) La-Chatelier method	3.0 mm	OK
3	Standard Consistency	IS: -4031 (part-4)	25.00%	OK
4	Compressive Strength			OK
	a) 3 Days	Mpa	26	OK
	b) 7 Days	Mpa	37	OK

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Survey and Engineering Project Consultants

TEST REPORT ON FINE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : Sand

Total Wt of Aggregate in gms : 1350

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
10	0	0	0	100	100
4.75	30	30	2.22	97.78	90-100
2.36	62	92	6.81	93.82	75-100
1.18	90	182	13.48	86.52	55-90
600 Micron	480	662	49.03	50.97	35-59
300 Micron	358	1020	75.55	24.45	8-30
150 Micron	325	1345	99.62	0.38	0-10

Note:

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Assistant Executive Engineer
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Survey and Engineering Project Consultants

TEST REPORT ON COARSE AGGREGATE

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing: 19-08-2019

SAMPLE ID : 20 mm Aggregate

Total Wt of Aggregate in gms : 2300

IS Sieve Size in mm	Weight of Retained (gms)	Cumulative Weight of Retained (gms)	Cumulative % of Retained (gms)	Cumulative % of passing	Percentage Passing for grading zone II as per IS 383-1970
40	0	0	0	100	100
20	195	195	8.125	91.87	95-100
10	1150	1345	56.04	43.96	25-55
4.75	955	2300	95.87	4.125	0-10

1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
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Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

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B V H Consulting Engineers
Survey and Engineering Project Consultants

TEST REPORT ON REINFORCEMENT STEEL

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : 20-08-2019

SAMPLE ID : Fe 500 TMT Steel Bars

Sl. No	Dia in MM	Weight in Kg/m	C/s area in mm2	Ultimate load in KN	Ultimate Tensile stress in N/mm2	Remarks
1	10	0.616	78.53	41.84	533	OK
2	12	0.888	113.097	61.94	548	OK
3	16	1.578	201.061	109.5	545	OK

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3. Any Query regarding the report must be within 30 days from the date of testing.

Comments: Minimum Ultimate Tensile strength of Fe 500 steel is 500N/mm square

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
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B V H Consulting Engineers
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TEST REPORT ON REINFORCEMENT STEEL

NAME OF WORK: Package2 Improvements to roads and drains providing amenities construction of RO water plant Bangalore one center in ward no.7& 8Byatarayanapura Division as per annexure Go No UDD 217 SFC 2016 Dated 28.5.2016 works Sl No for Ward No. 7 12 To 23 & Ward No. 8 24 To 32.

Sub - Name of Work : Constructon of RO Water Purifie at Balaji Layout, Devinagar and BB Nagar in Ward No 8 Kodigehalli,Kodigehalli Sub Division.

Client : Executive Engineer, Kodigehalli Division, NO.2152/20, Defence colony, Sahakara Nagara, Bangalore-92

Name of the Agency : Benaka Developers & Projects Pvt. Ltd.

Reference: Agreement NO.BBMP/EE/BTP/AG/007/16/000043/16-17 Dated : 16/01/2018

Date of Testing : 20-08-2019

SAMPLE ID : Fe 500 TMT Steel Bars

Sl. No	Dia in MM	Weight in Kg/m	C/s area in mm2	Ultimate load in KN	Ultimate Tensile stress in N/mm2	Remarks
1	10	0.616	78.53	41.84	533	OK
2	12	0.888	113.097	61.94	548	OK
3	16	1.578	201.061	109.5	545	OK

1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be within 30 days from the date of testing.

Comments: Minimum Ultimate Tensile strength of Fe 500 steel is 500N/mm square

Assistant Executive Engineer
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